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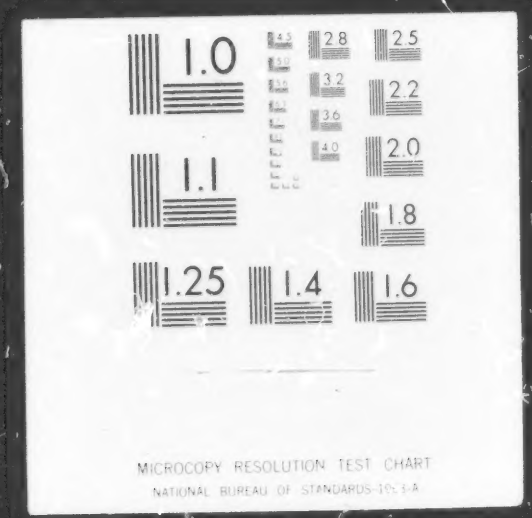

DOCUMENT RESUME

ED 091 324 SP 007 957

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TITLE Developing/Modifying Student Affective Behaviors.
NOTE 74p.

EDRS PRICE MF-$0.75 HC-$1.50 PLUS POSTAGE
DESCRIPTORS *Affective Behavior; *Affective Objectives; *Behavior Change; Classroom Research; Educational Research; *Inservice Teacher Education; Interaction Process Analysis; Student Behavior; Teacher Behavior; Teacher Education

ABSTRACT

At the University of Nebraska-Lincoln, the Instructional Staff Development Program, Component VI, Developing/Modifying Student Affective Behaviors focuses upon some affective behaviors that promote and are considered vital to the inquiry process. Through teachers trained in the development of affective behaviors, this program has achieved changes in student attitudes as measured both by attitude inventories and by direct observations. Teachers and students increased their use of affective behaviors. Teachers asked more affective questions and spent more time building on student ideas after instruction. Teacher talk decreased to only 14.3% of the total interaction with approximately 7% of that in the category of positive reinforcement. (Author)

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Developing/Modifying Student Affective Behaviors

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Introduction

The development and/or modification of student affective behaviors (indicators of attitudes) is a much discussed but minimally achieved goal in education today. Recognizing the importance of the attitudes of OPENNESS and INQUIRY ORIENTATION to the success of classroom inquiry, the NU/McREL Staff Development (ISD) program identified specific behaviors which were indicators of these broad attitudes and prepared Component VI as an instructional unit to develop these behaviors. Following three years of development and pilot testing, the entire ISD program including Component VI was tested in a small field project. The research reported here covers the data collected in the field project relating to affective behaviors.

Goals

The field project was designed to assess the effectiveness of the ISD program and its trainers in bringing about changes in behaviors of teachers and students in the direction of the goals of the program. In the affective domain, these goals were:

Following instruction in affective behaviors, the students will:

1. Participate more willingly and will contribute at least 60 per cent of the total interaction.
2. Exhibit more OPENNESS behaviors, amounting to at least 40 per cent of the total interaction.
3. Exhibit more INQUIRY ORIENTATION behaviors, amounting to at least 10 per cent of the total interaction.
4. Demonstrate an increased use of the affective behaviors by increasing the percentage of affective behaviors to total interaction and to student interaction.
5. Exhibit a more balanced pattern of affective behaviors. All OPENNESS and INQUIRY ORIENTATION behaviors would be utilized, but 1's (volunteering information and divergent views) would be the primary behaviors in terms of quantity.

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6. Express attitudes which indicate an understanding of the inquiry process, a positive feeling toward inquiry activities, and behaviors in the inquiry activities which correspond to the attidues expressed.

These goals were considered as research hypotheses for the study and form the basis for reporting the findings in this paper.

Procedures

Four ISD trainers certified as meeting all competencies as trainers conducted the field project with twenty teachers and their students. Data on the teacher and student behaviors were gathered using 1) Flanders' Interaction Analysis system for total interaction, 2) Inquiry Analysis System[1] for cognitive inquiry behaviors, and 3) Component VI Affective Checklist (Figure 1) for affective behaviors. A Student Inventory and an interview sheet (Figures 2 and 3) were used to gather data on student attitudes and understandings about the inquiry process and activities during the project.

As shown on the Affective Checklist, nine specific behaviors were identified as indicators of OPENNESS and eight specific behaviors identified as indicators of INQUIRY ORIENTATION. Data were gathered via videotapes during small group sessions. A trained observer coded the appropriate teacher and student behaviors from the videotapes. Tests for coder reliability were completed prior to and after all data had been collected.

Research Design

A pre-post design was used to determine achievement of goals. To ascertain if behavioral modifications were statistically significant, a t-test was administered using the formula:[2] $t = \frac{m_1 - m_2}{SE_1^2 + SE_1^2}$

1. Seagren, et.al., Component III - Inquiry Behaviors Trainer's Manual, Kansas City, Mid-Continent Regional Educational Laboratory, July, 1972.
2. Henry E. Garrett, Statistics in Psychology and Education, New York: Longmans, Green and Company, 1951, page 190.

Figure 1

COMPONENT VI -- AFFECTIVE CHECKLIST

Teacher_____ Date_____ Tape #____ Subject_____ Pre Post__

SUMMARY 1	2	3	4	5	6	T	BEHAVIORS	TALLIES
							OPENNESS	
							1a Volunteers information	
							1b States Divergent view	
							2a Recognizes incompleteness	
							2b Answer question	
							2c Accepts other views	
							3a Praises others	
							3b Accepts feelings	
							3c Right to different conclusion	
							3d Seeks ideas and data from others	
							INQUIRY ORIENTATION	
							4a Recognition of inquiry factors	
							4b Expresses needs of group	
							5a Asks for clarification or support	
							5b Asks clarification or references	
							6a Confidence can achieve objectives	
							6b States willingness to continue	
							7a Records assessment	
							7b Suggestions for next session	

Figure 2
COMPONENT VI INVENTORY

Student Questionnaire

Note: students were asked to respond to each statement by marking strongly agree, agree, undecided or neutral, disagree, or strongly disagree.

1. I enjoy inquiry sessions.
2. I feel that I am open-minded during our inquiry sessions.
3. We wasted too much time in our small group.
4. I felt at ease answering questions about my own ideas.
5. I was anxious to contribute my ideas.
6. We generally stayed on the track and accomplished our goal.
7. I kept wanting facts to support the different ideas.
8. I didn't participate as much in the small groups as I usually do in complete class sessions.
9. I felt at ease questioning the ideas of others in the group when I disagreed with them.
10. I feel confident in an inquiry session that we accomplish something worthwhile.
11. I feel more at ease in an inquiry session now than I did at the first of the semester.
12. Other classes should use inquiry sessions more than they do.
13. The affective behaviors emphasized this semester (openness and inquiry orientation) are not very important.
14. If the evidence on the issue favors the opposing view, I would be willing to change my view.
15. Our work in this class this semester has been more student centered that it was last semester.
16. I think that I use the affective behaviors pretty well in inquiry sessions.
17. The affective behaviors, when used, helped our group accomplish its goals.
18. I would rather have the teacher lead our inquiry session than to work in a small group by ourselves.
19. I would like to have more small group sessions.
20. I have used the affective behaviors I learned in this class in other classes and in out-of class situations.
21. I prefer large group discussions more than small group inquiry.
22. The affective behaviors were emphasized by the teacher just before and during the videotaped inquiry sessions but not the rest of the time.
23. I enjoy assessing myself and my group in terms of content learned, decisions made, and process used.
24. On the whole, I think our class has learned more this semester using the inquiry process than we would have using another type of experience.
25. Our teacher seems to be using more of the affective behaviors than before.

Figure 3

Student Interview Sheet

1. What was your goal(s) for the session?
   Seek both content and process goals if they have them.

2. What process did you follow (use) to accomplish your goal(s)?
   Seek both inquiry factors and procedures. Seek "who".

3. How and why did you determine to use this process?
   Seek who made the decisions and the reasons for doing what they did.

4. Were you successful in accomplishing your goals?
   If yes, what contributed to your success?
   If no, what hindered your progress?

5. How did you feel using certain affective behaviors during the classroom sessions? Enjoyment, frustration, etc.
   Did they contribute to your understanding of both the content and other member's personalities?

6. Would you like to participate in this type of activity quite often? Seek enthusiasm for inquiry and affective behaviors.

7. What suggestions would you make to improve this activity?
   Affective behaviors, content, instruction, etc.

Data from the observations were tallied, key punched and reported in computer print-out form. Data from the Student Inventory and the interviews were tabulated in similar fashion. A complete report of the results of Component is contained in the Assessment Report of the 1971-1972 ISD Field Project.[3]

Findings

Four of the six goals established for Component VI were achieved while two goals were partially achieved but not to the extent specified in the goal statements. Summary data are reported in the tables included in this paper. Table 1 provides the mean percentages of all behaviors exhibited by both teachers and students in the pre and post instructional sessions for each of the seventeen affective behaviors. Table 2 provides the mean percentages of all student talk in the pre and post instructional sessions on the same seventeen affective behaviors. Table 3 presents the mean scores of student attitudes expressed on each of the twenty-five statements included in the Student Inventory.

Goal 1: Students would participate more willingly and would contribute at least 60 per cent of the total interaction.

This goal was achieved; the students increased their participation from 21.1 per cent to 76.5 per cent of the total interaction. There was a definite shift from a teacher-centered to a student-centered pattern and the criterion level of 60 per cent was surpassed.

The remaining goals focus on the specific affective behaviors which indicate OPENNESS and INQUIRY ORIENTATION within the above stated interaction pattern.

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3. Alan T. Seagren, et. al., 1971-1972 ISD Field Test Assessment Report, Kansas City: Mid-Continent Regional Educational Laboratory, 1973.

Table 1

Mean Percentages of All Teacher and Student OPENNESS and INQUIRY ORIENTATION Behaviors During Pre and Post Instructional Sessions

Behaviors	Teacher Behaviors			Student Behaviors		
	Pre	Post	Level Sign.	Pre	Post	Level Sign.
1a - Volunteers information	19.2	5.5	.01	13.7	45.1	.01
1b - States divergent view	.6	*	NS	2.3	6.3	NS
Total 1's	19.8					
2a - Recognizes incompleteness	.9	*	NS	.3	2.3	.01
2b - Answers questions	.5	*	NS	1.5	2.1	NS
2c - Accepts other views	*	*	NS	.1	.6	NS
Total 2's	1.4	*	.01	1.8	4.9	.01
3a - Praises others	1.7	.4	.01	*	.6	NS
3b - Accepts feelings	.1	*	NS	.0	.2	NS
3c - Right to different conclusion	.1	*	NS	*	.2	NS
3d - Seeks ideas and data	10.2	2.7	.01	1.1	5.3	.01
Total 3's	12.1	3.2	.01	1.1	6.3	.01
Total OPENNESS Behaviors	33.3	8.9	.01	19.0	62.8	.01
4a - Recognition of inquiry factors	1.5	.8	NS	.1	1.2	.01
4b - Expresses needs of group	1.5	.7	NS	.2	2.5	.01
Total 4's	3.0	1.5	NS	.3	3.7	.01
5a - Clarification of ideas	1.8	.2	NS	*	.9	NS
5b - Clarification of resources	.2	.3	NS	.0	.2	NS
Total 5's	2.0	.5	NS	*	1.1	NS
6a - Confidence in process	.0	.0	NS	.0	.0	NS
6b - Willingness to continue	.0	.0	NS	*	*	NS
Total 6's	.0	.0	NS	*	*	NS
7a - Assessment	.1	.1	NS	*	1.4	.01
7b - Suggestions for next session	.1	*	NS	.0	.5	NS
Total 7's	.2	.1	NS	*	1.9	.01
Total INQUIRY ORIENTATION	5.2	2.2	NS	.3	6.9	.01
Total All Affective Behaviors	38.5	11.1	.01	19.3	69.7	.01
Total Teacher Talk and Student Talk (Interaction Analysis)	71.1	11.5		21.1	76.5	

Goal 2: Students would exhibit more OPENNESS behaviors, amounting to at least 40 per cent of the total interaction.

Goal 2 was achieved; the students increased significantly (.01 level) the OPENNESS behaviors utilized. The shift in the use of OPENNESS behaviors from 19.0 to 62.8 per cent of the total interaction was primarily through the increased use of 1a's - volunteering information, 3d's - seeking ideas and data from others, and 2a's - recognizing the need for support data. The increase for each of these specific behaviors was significant at the .01 level.

While the total amount of OPENNESS behaviors exhibited by students increased significantly, the data from Table 2 reveal that the percentage for each of the OPENNESS behaviors remained nearly constant when considering only student talk. Volunteering information (1a), for example, accounted for approximately 59 per cent of the student talk in both the pre and post sessions However, this was actually 59 per cent of 13.7 per cent of the total interaction in the pre session and 59 per cent of 45.1 per cent of the total interaction in the post session. Thus the percentage of the total interaction increased significantly but the distribution of behaviors remained constant.

Goal 3: Students would exhibit more INQUIRY ORIENTATION behaviors, amounting to at least 10 per cent of the total interaction.

Goal 3 was not achieved; the students increased their INQUIRY ORIENTATION behaviors from .3 per cent to 6.9 per cent of the total interaction (significant at .01 level), but the total failed to reach the criterion level of 10 per cent specified in the goal. This failure to achieve the level specified for INQUIRY ORIENTATION behaviors combined with the feedback from the student interviews and inventory sheets has caused the ISD staff to hypothesize that the presence of the specified behaviors is sufficient to facilitate the learning process without consideration of the quantity of use of these behavior

Table 2

Mean Percentages of Student Talk Only Comparing Shifts in Behaviors from Pre to Post Instructional Sessions

Behavior	% of Student Talk		Significance
	Pre	Post	
1a - Volunteers information	58.6	58.8	NS
1b - States divergent view	8.6	8.1	NS
Total 1's	67.2	66.9	NS
2a - Recognizes incompleteness	1.2	2.9	NS
2b - Answers questions	5.2	2.8	NS
2c - Accepts other views	.3	.7	NS
Total 2's	6.7	6.4	NS
3a - Praises other	.1	.8	NS
3b - Accepts feelings	.0	.3	NS
3c - Right to different conclusion	.0	.3	NS
3d - Seeks ideas and data	6.0	6.8	NS
Total 3's	6.1	8.2	NS
Total OPENNESS behavior	80.2	81.4	NS
4a - Recognition of inquiry factors	.2	1.5	.01
4b - Expresses needs of group	.7	2.9	.01
Total 4's	.9	4.4	.01
5a - Asks for clarification/support	.4	1.1	.01
5b - Asks clarification/reference	.0	.4	NS
Total 5's	.4	1.4	.01
6a - Confidence in inquiry process	.0	.0	NS
6b - States willingness to continue	.1	*	NS
Total 6's	.1	.1	NS
7a - Records assessment	.1	1.6	.01
7b - Suggestions for next session	.0	.6	.01
Total 7's	.1	2.2	.01
Total INQUIRY ORIENTATION	1.4	8.2	.01
Total All Affective Behaviors	81.6	89.6	NS

* = behavior exhibited but less than .1%

Specific INQUIRY ORIENTATION behaviors which were significant (.01 level) increases were: recognition of inquiry factors (4a), expresses needs of group (4b), and assessment (7a). Shifts in these behaviors were significant when both teacher and student behaviors were considered and also when student behaviors were considered alone. As shown in Table 2, significant increases were recorded for five of the eight INQUIRY ORIENTATION behaviors and for the entire INQUIRY ORIENTATION area.

Goal 4: Students would demonstrate an increased use of affective behaviors by increasing the percentage of affective behaviors to total interaction and to student interaction.

Goal 4 was achieved: In the pre sessions, 57.8 per cent of the total behaviors were recorded as affective behaviors, with 19.3 per cent of this amount exhibited by students. Following instruction, 80.8 per cent of the total behaviors were recorded as affective behaviors, including 69.7 per cent by the students. When student behaviors were considered separately (Table 2), the use of affective behaviors increased from 81.6 per cent to 89.6 per cent of total student talk. Thus, both aspects of the goal were achieved.

Goal 5: Students would exhibit a more balanced pattern of affective behaviors. All OPENNESS and INQUIRY ORIENTATION behaviors would be utilized, but 1's (volunteering information and divergent views) would continue to be the primary behaviors in terms of quantity.

Better balance among the affective behaviors was partially achieved through the increased use of INQUIRY ORIENTATION behaviors, but the goal was not achieved as stated because one behavior was not exhibited (6a) by either the students or the teachers. In addition to this void, nine other behaviors were exhibited less than one per cent of the time.

Volunteering information (1a) continued to be the behavior most often exhibited followed by divergent views (2b) and seeking ideas and data from others (3d). The INQUIRY ORIENTATION behavior used most often was expressing needs of the group (4b). The OPENNESS behaviors were exhibited much more often than the INQUIRY ORIENTATION behaviors both before and after instruction. When student behaviors alone were considered, significant percentage increases were shown in the INQUIRY ORIENTATION area.

Goal 6: Students would express attitudes which indicate an understanding of the inquiry process, a positive feeling toward inquiry activities, and behaviors in the inquiry activities which correspond to the attitudes expressed.

Student attitudes as expressed on the Student Inventory are summarized in Table 3. The interview data complements the Inventory data and both correspond closely to the verbal behaviors exhibited by the students in the inquiry sessions. Goal 6 was therefore achieved.

All of the items on the Inventory showed positive attitudes (mean ratings below 3.0). Generally, the students expressed interest and enthusiasm for inquiry activities and expressed the desire to participate in more inquiry-oriented learning experiences. They felt that their inquiry sessions were productive and that they had gained the necessary skills and knowledge to achieve their objectives through the inquiry process. Most of the students felt at ease in inquiry sessions and were willing to volunteer data, to be risk-takers, to question others and to be questioned by others in the group. These attitudes correspond closely to the behaviors showing increased utilization by the students in their inquiry sessions.

Table 3
Summary of Mean Scores on Student Questionnaire (Inventory)

(Scores below 3.0 represent positive attitudes; items marked with * are negative statements with mean scores transposed to correlate with other items)

	Item	Mean Score
1.	I enjoy inquiry sessions.	2.45
2.	I feel that I am open-minded during our inquiry sessions.	2.42
*3.	We wasted too much time in our small group.	2.62
4.	I felt at ease answering questions about my ideas.	2.50
5.	I was anxious to contrubute my ideas.	2.63
6.	We generally stayed on the track and accomplished our goal.	2.40
7.	I kept wanting facts to support the different ideas	2.62
*8.	I didn't participate as much in the small groups as I usually do in the large group sessions.	2.38
9.	I felt at ease questioning the ideas of others in the group when I disagreed with them.	2.51
10.	I feel confident in an inquiry session that we accomplish something worthwhile.	2.43
11.	I feel more at ease in an inquiry session now than I did at the first of the semester.	2.29
12.	Other classes should use inquiry sessions more than they do.	2.55
*13.	The affective behaviors emphasized this semester (openness and inquiry orientation) are not very important.	2.47
14.	If the evidence on the issue favors the opposing view, I would be willing to change my view.	2.53
15.	Our work in this class ths semester has been more student centered than it was last semester.	2.29
16.	I think that I use the affective behaviors pretty well in inquiry sessions.	2.53
17.	The affective behaviors, when used, helped our group accomplish its goals.	2.44
*18.	I would rather have the teacher lead our inquiry session than to work in a small group by ourselves.	2.68
19.	I would like to have more small group sessions.	2.41
20.	I have used the affective behaviors I learned in this class in other classes and in out-of-class situations.	2.67
*21.	I prefer large group discussions more than small group inquiry.	2.65
*22.	The affective behaviors were emphasized by the teacher just before and during the videotaped inquiry sessions but not the rest of the time.	2.89
23.	I enjoy assessing myself and my group in terms of content learned, decisions made, and process used.	2.51
24.	On the whole, I think our class has learned more this semester using the inquiry process than we would have using another type of experience.	2.55
25.	Our teacher seems to be using more of the affective behaviors than before.	2.53

The most positive attitudes were expressed on item 11 - "I feel more at ease in an inquiry session now than I did at the first of the semester" and item 15 - "Our work in this class this semester has been more student centered than it was last semester." The least positive rating was given to item 22 - "The affective behaviors were emphasized by the teacher just before and during the videotaped sessions but not the rest of the time." The mean scores on the Inventory produced a rather narrow range from the most positive (2.29) to the least positive rating (2.89).

Other findings which are not presented in Table 3 but which were reported in the field project include 1) attitudes of social studies students were consistently more positive than the attitudes of biology students, 2) the social studies students consistently exhibited greater use of the affective behaviors than did the biology students, 3) the attitudes which reflect OPENNESS were rated more positively than those reflecting INQUIRY ORIENTATION, and 4) from the interviews, the students felt that they were using the affective behaviors in situations outside the classroom and felt that they were essential to effective living.

Summary

Attitudes important to inquiry - OPENNESS and INQUIRY ORIENTATION - can be specified as affective behaviors for feedback, analysis, and instructional purposes. These affective behaviors can be developed and/or modified through instruction such as that provided in the ISD program. Evidence gathered in the ISD field test supports the conclusion that students can be encouraged to increase their use of affective behaviors, can use the various behaviors to promote learning, and that the behaviors are excellent indicators of attitudes